

WHAT IS CLAIMED IS:

1. An air flow rate measuring apparatus comprising:

a detector flow tube projecting into an airflow channel so as to be perpendicular to a main direction of flow of air inside said airflow channel, a diversion passage through which a portion of said air is permitted to flow being formed in said detector flow tube; and

a flow rate detecting element disposed inside said diversion passage,  
wherein:

said diversion passage is constructed into an inverted U shape in which an upstream diversion passage and a downstream diversion passage each having a passage direction in a direction of projection of said detector flow tube communicate by means of a curved portion,

an inflow port of said diversion passage is constructed by removing a portion of a wall of said upstream diversion passage on an upstream side in said main direction of flow of said air, and removing at least a portion of first and second side walls of said upstream diversion passage facing each other in a direction perpendicular to said main direction of flow of said air and said direction of projection of said detector flow tube, and

a wall surface on a downstream side of said upstream diversion passage in said main direction of flow of said air at said inflow port is formed into a curved surface shape that is gradually displaced upstream relative to said direction of projection of said detector flow tube to constitute an air lead-in surface.

2. The air flow rate measuring apparatus according to Claim 1, wherein:

said air lead-in surface is formed into a concave surface shape that is gradually displaced upstream from a central portion toward first and

second sides relative to a direction perpendicular to said main direction of flow of said air and said direction of projection of said detector flow tube.

3. The air flow rate measuring apparatus according to Claim 2, wherein:

a penetrating aperture is disposed through a substantially central portion of said air lead-in surface so as to communicate between said inflow port and said airflow channel outside said detector flow tube in said direction of projection.

4. The air flow rate measuring apparatus according to Claim 1, wherein:

said air lead-in surface is formed into a convex surface shape that is gradually displaced downstream from a central portion toward first and second sides relative to a direction perpendicular to said main direction of flow of said air and said direction of projection of said detector flow tube.

5. The air flow rate measuring apparatus according to Claim 4, wherein:

a discharge lane for catching foreign matter contained in said air and discharging said foreign matter to a main flow of said air flowing along a side portion of said detector flow tube is formed on said air lead-in surface.

6. The air flow rate measuring apparatus according to Claim 1, wherein:

a discharge port of said diversion passage is constructed by removing a portion of a wall of said downstream diversion passage on a downstream side in said main direction of flow of said air, and removing at

least a portion of first and second side walls of said downstream diversion passage facing each other in a direction perpendicular to said main direction of flow of said air and said direction of projection of said detector flow tube, and

a wall surface on an upstream side of said downstream diversion passage in said main direction of flow of said air at said discharge port is formed into a curved surface shape that is gradually displaced downstream relative to said direction of projection of said detector flow tube to constitute an air discharge surface.

7. The air flow rate measuring apparatus according to Claim 1, wherein:

said flow rate detecting element is disposed in said curved portion of said diversion passage, and

a passage cross-sectional area of said curved portion is formed so as to reduce gradually from an upstream end to a position of installation of said flow rate detecting element and to enlarge gradually from said position of installation of said flow rate detecting element toward a downstream end.

8. The air flow rate measuring apparatus according to Claim 1, wherein:

said detector flow tube is constructed so as to project into said airflow channel such that said air lead-in surface is positioned substantially at a central axis of said airflow channel.